

ABSTRACT

A speaker has a magnet structure mounted ahead of the speaker diaphragm to produce a shallow compact unit. The magnet structure defines a flux gap, and a voice coil residing in the 5 flux gap is connected to a main diaphragm such that drive current applied to the voice coil moves the diaphragm to generate sound. The voice coil and magnet structure provide a flux gap at the rear of the magnet structure, ahead of and centered on the main diaphragm, while the magnet occupies space within the cone, freeing up space in the rear. In one embodiment, the magnet structure has an additional flux gap located at its forward end and the speaker includes an 10 additional diaphragm driven by a coil positioned in the additional flux gap. The main diaphragm and additional diaphragm are better positioned to maintain a common sound center for enhanced spatial fidelity and different tuning techniques present a broad flat response below crossover to form a pinpoint sound source of wide angular coverage. The back wave couples directly into an enclosure, which may be a shallow, panel mount assembly. The magnet structure may possess 15 an opening extending through the center of the structure allowing control over the acoustics through enclosure compliance or damping effects to enhance response of the system.

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